

Amendments to Claims:

Claims 1 – 3: (Cancelled).

Claim 4: (Currently Amended) ~~The method of claim 1 wherein said probe comprises a diamond-tipped ATR probe.~~

A method for regulating the concentration of water in the acid feed stream in a process for the production of HF by the reaction with a fluorine containing material comprising:

(a) providing an acid feed stream comprising acid, bound water and free water;

(b) estimating the concentration of bound water and free water in the acid feed stream by providing a diamond-tipped ATR probe in at least a portion of said feed stream; and

(c) adjusting the concentration of free water in said acid feed stream based on said estimating step.

Claims 5 – 10: (Cancelled).

Claim 11: (Previously Amended) A method for controlling water content of an acid comprising the steps of:

(a) providing an acid;

(b) determining the concentration of water in said acid using an

in-line measurement system comprising a computer and an infrared analyzer equipped with a diamond-tipped ATR probe; and

okay to  
enter  
nfw  
a/16/04

(c) adjusting the concentration of free water in said acid based on the concentration of water measured in step (b).

Claim 12: (Original) The method of claim 11 wherein said acid comprises sulfuric acid, hydrofluoric acid, fluorosulfonic acid, and water.

Claim 13: (Cancelled)

Claim 14: (Original) The method of claim 11 wherein said adjusting step (c) comprises adding a drying agent to said acid mixture to form a dried acid mixture comprising a concentration of free water lower than the concentration determined in step (b).

Claims 15 – 16: (Cancelled).

Claim 17: (Currently Amended) ~~The method of claim 15 wherein said in-line measurement system comprises a computer and an infrared analyzer equipped with a diamond-tipped probe.~~

A method for manufacturing hydrofluoric acid comprising the steps of:

- (a) providing an acid mixture;
- (b) determining the concentration of free water in said acid mixture using an in-line measurement system comprising a computer and an infrared analyzer equipped with a diamond-tipped probe;

- (c) adding a drying agent to said acid mixture to form a dried acid mixture comprising a concentration of free water lower than the concentration determined in step (b);
- (d) reacting said dried acid mixture with fluorspar to form hydrofluoric acid.

Claim 18: (Previously Amended) A method for manufacturing hydrofluoric acid comprising the steps of:

- (a) providing a stream comprising sulfuric acid, hydrofluoric acid, fluorosulfonic acid and water;
- (b) determining the concentrations of free water and bound water in said stream using an in-line measurement system comprising a computer and an infrared analyzer equipped with a diamond-tipped ATR probe; and
- (c) adjusting the concentration of free water in said acid feed stream based on said estimating step.

Claim 19: (Original) The method of claim 18 wherein said adjusting step comprises introducing an amount of sulfur trioxide sufficient to convert substantially all of said free water in said stream to sulfuric acid.